Fig. 4. Section of the test, magnified 50 diameters.
The section is of very unequal thickness, but serves to show the arenaceous structure of the test, and the character of the constituent grains, many of which are minute Foraminifera.

Fig. 5. A portion of the surface at *a* (fig. 3) magnified 8 diameters; showing the closed terminations of the tubes; and, at *c*, a portion of one of the concentric reticulated "partitions."

PLATE 3.

Fig. 6. Radial section (fractured surface) magnified 8 diameters; *d.d.* reticulated "partitions."

Fig. 7. Tangential section (fractured surface) on the plane of one of the reticulated "partitions" (*d.d.*), magnified 8 diameters.

Fig. 8. Inferior aspect; a portion magnified 8 diameters, showing the smaller size and contorted form of the tubes near the centre of the test.

April 26, 1883.

THE TREASURER, V.P., in the Chair.

The Presents received were laid on the table and thanks ordered for them.

The following Papers were read:—

I. "Contributions to the Chemistry of Food." By JAMES BELL, Ph.D., F.C.S. Communicated by Professor FRANKLAND, F.R.S. Received April 4, 1883.

(Abstract.)

This paper contains the results of researches on butter, cheese, milk, the cereal foods, bread and lentil flour.

The author some time ago, as the result of a series of experiments, indicated that it was probable the soluble and insoluble fatty acids in butter fat did not exist as simple glycerides, but in the complex form of compound ethers—palmitic and oleic acids being combined in the same molecule with butyric acid. The results of a further investigation into the character of butter fat are given, which tend to confirm this theory of its constitution. Butter fat is proved to vary in composition far beyond the limits previously supposed, and a table of representative samples is given, showing the ordinary variations which occur. Ordinary fats are contrasted with butter fat, and it is sug-

gested that the latter, from its complex character, probably performs some more specific office in the system than the former.

The proximate analyses of ten descriptions of cheese are given, and the composition of the fat extracted has been determined in each case. The soluble and insoluble fatty acids are shown to possess the normal relation existing between these acids in milk fat, a result held to be inconsistent with the views advanced by some chemists that the albuminoids become slowly changed into fat.

Tabular results are given of a wide and comprehensive investigation into the variations which occur in the composition of the milk yielded by different cows under the varying conditions of food and season. Besides cow's milk, the proximate constituents of other kinds of milk have been determined, and as the analyses of the whole of the milks have been conducted on an uniform method, the results will be found valuable for purposes of comparison.

The changes which occur in sour milk have been investigated and the results given, with a statement of the amount of depreciation which occurs in the non-fatty solids, according to the period for which the milk has been kept.

Tabular results are given of the proximate analyses of the different cereals, of wheat flour, and of oatmeal, and also a complete analysis of the ash of each. The proximate constituents of the cereals, &c., have been partly determined on new lines, and partly by an improved method of analysis.

Judging from the variable results obtained by different chemists, the author suggests that the saccharine matter appears in some instances to have been overlooked, while in others it must have been determined in an aqueous extract of the cereals, without regard to the transformations which the soluble albuminoids produce in starch and other carbohydrates in presence of water.

The albuminoids of the cereals have been found to possess varying degrees of diastatic action in converting starch, rye standing at the top, and rice at the bottom of the scale.

Tabular results of the proximate analyses of aërated and home-made bread are given; the changes which occur in flour during the baking process have been studied, and the sugar present identified as maltose. The results of a proximate analysis of lentil flour made on the same lines as the cereals, are given, and also a complete analysis of the ash of lentils.